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Atty. Dkt. No. 039153-0472 (G1177)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Besser et al.

Title: METHOD OF IMPLANTING
COPPER BARRIER MATERIAL TO
IMPROVE ELECTRICAL
PERFORMANCE

Appl. No.: 09/994,397

Filing Date: 11/26/2001

Examiner: Guerrero, Maria F

Art Unit: 2822

CERTIFICATE OF MAILING I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, Virginia 22313-1450, on the date below. <u>Deborah Kacorowski</u> (Printed Name) <u>Deborah A. Kacorowski</u> (Signature) <u>August 20 2003</u> (Date of Deposit)

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §1.56

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

Sir:

Submitted herewith on Form PTO-1449 is a listing of documents known to Applicants in order to comply with Applicants' duty of disclosure pursuant to 37 CFR §1.56. A copy of each listed document is being submitted to comply with the provisions of 37 CFR §1.97 and §1.98.

The submission of any document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* art reference against the claims of the present application.

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TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(d), before payment of the issue fee.

RELEVANCE OF EACH DOCUMENT

All of the documents are in English.

Applicants respectfully request that any listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO-1449 be returned in accordance with MPEP §609.

STATEMENT

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The undersigned hereby states in accordance with 37 CFR §1.97(e)(1) that references A1, A3, A6, A9 and A10-A15, contained in this supplemental information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three (3) months prior to filing of this Statement.

The undersigned hereby states in accordance with 37 CFR §1.97(e)(2) that references A2, A4-A5 and A7-A8 were not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the undersigned, after making reasonable inquiry, references 2-6 were not known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of the supplemental information disclosure statement.

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FEE

A fee in connection with submission of a supplemental information disclosure statement under 37 CFR §1.97(d) in the amount of \$180.00 in accordance with 37 CFR §1.17(p) is attached.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 CFR §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447.

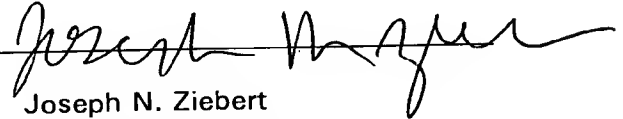
Respectfully submitted,

Date

8-18-03

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By



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Form PTO-1449 (MODIFIED) AUG 25 2003 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE CITATION (Use several sheets if necessary)	ATTY. DOCKET NO. 039153-0472 (G1177)	SERIAL NO. 09/994,397
	APPLICANT Besser et al.	
	FILING DATE 11/26/2001	GROUP ART UNIT 2822

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB- CLASS	FILING DATE IF APPROPRIATE
	A1	6,534,865	03/18/2003	Lopatin et al.	257	751	
	A2	6,365,502	04/02/2002	Paranjpe et al.	438	622	
	A3	6,242,808	06/05/2001	Shimizu et al.	257	762	
	A4	6,225,221	05/01/2001	Ho et al.	438	678	
	A5	6,117,770	09/12/2000	Pramanick et al.	438	659	
	A6	6,090,710	07/18/2000	Andricacos et al.	438	687	
	A7	6,015,749	01/18/2000	Liu et al.	438	628	
	A8	2002/0109233	08/15/2002	Farrar	257	762	
	A9	2001/0035237	11/01/01	Nagano et al.	148	430	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION	
							YES	NO
	A10	EP 1 094 515 A2	04/25/2001	EPO				
	A11	EP 1 039 531 A2	09/27/2000	EPO				
	A10	EP 1 039 531 A3	12/20/2000	EPO				
	A10	EP 0 567 867 A2	11/03/1993	EPO				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	A14	Dong Joon Kim et al, "New Method to Prepare W-B ⁺ -N Ternary Barrier to Cu diffusion by Implanting BF ₂ ⁺ Ions Into W-N Thin Film," J. Vac. Sci. Technol. B 17(4), July/Aug, 1999, pp. 1598-1601.
	A15	W. F. McArthur et al., "Structural and Electrical Characterization of Si-Implanted Tin as a Diffusion Barrier for Cu Metallization," Mat. Res. Soc. Symp. Proc. Vol. 391, 1995, pp. 327-332.
	A16	PCT International Search Report, International Application No. PCT/US 02/32605, International Filing Date 11/10/2002 (7 pages).
	A17	PCT International search Report, International Application No. PCT/US 02/32554, International Filing Date 11/10/2002 (5 pages).

EXAMINER

DATE CONSIDERED

- * EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include any copy of this form with next communication to applicant.